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Two New Species of *Marattia* from Bonin-Islands, and A New System proposed to *Marattiales*.

by

TAKENOSHIN NAKAI.

中井猛之進：小笠原島ニ産スルリウびんたいもどき屬植物ノ二新種トリウびんたいもどき
目ノ新分類法

In the subtropical Japan, *Marattia* is found only in the Bonin-Islands. The first example of Bonin-*Marattia* introduced to the science appears in *Botanische Zeitung* VI, 491 (1848), which was determined by KUNZE as *Marattia species dubia*. In August of 1912 Mr. SEIJI TAMAKI has collected the specimens of *Marattia* in the Hahazima Island (or Coffin Island) and delivered them to Dr. MAKINO. Dr. MAKINO identified it as *Marattia ternatea* DE VRIES and published it in *Tokyo Botanical Magazine* XXIV, 394 in December of the same year. However, until 1928 we Japanese botanists nor the forestry-experts of the Bonin Islands' Administration could find any living plants thereon, we at last began to suspect that the collector had mixed the specimens of other land with the Bonins. In the spring of 1928, Bonin Islands' forestry bureau opened new passes through the virgin forest of Mt. Tibusayama, the highest peak of the Hahazima Island. Along this new passes numbers of interesting plants have been found, and among them *Marattia* was most striking. This *Marattia* is the species which Dr. MAKINO had identified with *Marattia ternatea* and given a good diagnoses. Its caudex becomes enormous size, the diameter of which measuring often eighty centimeters to one meter. The stipes are stout, and the thickness of the largest one becomes 8-9 cm. at the base. The entire frond



第 1 圖 りうびんたいもどき自生ノ状態 小笠原島母島乳房山國有林ニテ前川理學士撮ル。

Marattia boninensis in its home. Photograph was taken by F. MAEKAWA in 1928.

attains four meters long, shooting out from the caudex. The leaves are deep green, but when they are still folding they are covered completely by soft dark-brown subulate scales. The adult fronds have dark-brown narrow nearly hairy scales both on the rachis of pinnæ and on the undersurface of pinnules, but in autumn, they become perfectly glabrous. The pinnæ are, as a rule, narrower than those of *Marattia ternatea* being 2-17 cm. long 7-20 mm. wide (usually 7-15 cm. long 10-15 mm. wide), the undersurface is more greenish than in *M. ternatea*, and the lowest pinnules are easy to become pinnate at the base. The synangia are intramarginal and beset with remarkable brown fimbriate involucre. The pinnæ and pinnules do not reflex as *Marattia ternatea*. The general aspect of this Bonin-*Marattia* is too similar to *Angiopteris boninensis* HIERONYMUS (*A. evecta* (non HOFFMANN) KUNZE 1848 etc.) haunted in Bonin-Islands, so if one does not care the scales on young fronds and the form of fructification he will sure to mistake with the latter species. This being an independent species, I shall call it as ***Marattia boninensis***.

In Bonin one more *Marattia* has been collected in July of 1928 in the virgin forest of Mt. Sekimonyama of the Hahazima Island by Mr. ATUSI YAMAMOTO. However, it was not known to us untill quite recently when he delivered the specimen to Mr. TUYAMA. TUYAMA considering it to be identical with *Marattia ternatea* put it in the same cover with other *Marattia*-specimens of Bonins. This has broader and shorter pinnules, and the indusia do not develop well as in *M. boninensis*. TUYAMA found the same species on the terracial summit of the Kita-Iwo Island (or San Alessandro Island) about eight hundred meters above the sea-level, last November. Most allied species of this is *Marattia fraxinea*, but it has more coarsely serrated segments, paler in colour beneath than ours. This *Marattia* belongs also to a new species, and I should like to give a new name ***Marattia Tuyamæ*** to it in memory of the collector.

***Marattia* (*Eu-Marattia*) *boninensis* NAKAI, sp. nov. (Fig. 1-2).**

Syn. *Marattia-ternatea* (non DE VRIES) MAKINO in Tokyo Bot. Mag. XXIV, 384 (1910) cum diagn.; MAKINO & NEMOTO, Fl. Jap. 1563 (1925); MATSUMURA, Shokubutsu-Mei-I, Rev. & enlarg. ed. 490 (1916); NAKAI in Rigakkawai XXVI, (Apr.) 9 (1918), in Bull. Biogeogr. Soc. Jap. I no. 3, 250 (1930); TOYOSHIMA, Ogasawarazima Kokuyûrin Shokubutu



第 2 圖 東京帝國大學理學部植物學教室所藏ノリうびんたいもどきの基準標本
The type specimen of *Marattia boninensis*, in the herbarium of Tokyo
Imperial University.

Gwaikwan 127 (1929); in Ogasawazima Sôran 303 (1929); MAKINO & NEMOTO, Fl. Jap. ed. 2, 2 (1931); NEMOTO, Suppl. Fl. Jap. 1 (1936).

Caudex magna globosa diametro usque ad 80 cm.—1m. Cicatrices frondum subrotundatæ. Stipulæ eroso-laciniatæ. Stipites virides juventute squamis castaneis subulatis 7–20 mm longis 1–3 mm latis tenuibus margine irregulari-dentatis apice caudatis densissime vestiti, sed adulti glabrescentes virides usque 150 cm. longi 8–9 cm. lati, lenticellis elongatis crebre notati. Lamina frondum bipinnata vel subtripinnata, juventute squamis stipitum conformibus densissime vestita sed adulta præter rachides et paginas inferiores pinnularum fere glabrescens. Pinnæ usque ad 80 cm. longæ 33 cm. latæ imparipinnatæ vel subbipinnatæ, ex rachide sursum angulo acuto patentēs sed oppositæ sub-V-forme divaricato-æquitantes, demum apice arcuato-reflexæ. Pinnulæ suboppositæ vel alternæ 20–30 jugæ imprimo involutæ fusco-barbatæ, adultæ plano-patentes apice arcuato-reflexæ sessiles vel breve stipitatæ 7–16 cm. longæ 10–18 mm. latæ apice subcaudato-attenuatæ margine obscure sed apice distincte serratæ, venis lateralibus subhorizontali-patentibus simplicibus vel ex basi bifurcatis parallelis apice parce vel haud clavatis, supra viridissimæ lucidæ, subtus viridulæ, pinnulis infimis sæpe bipinnatis tum frondes subtripinnatæ. Synangia intramarginalia supra receptacula elevata 1–3 mm. longa oblonga vel elliptica fusciscentia, involuero fusco bene evoluto tenue margine fimbriato obvallata, maturitate longitudine dehiscentia.

Habitat in Bonin.

Insula Hahazima (Coffin Island) : in monte Tibusayama (T. NAKAI, Aug. 1928, typus); ibidem (HIROKIYO TOYOSIMA, Sept. 1928); ibidem (TAKASI TUYAMA, Jun. 1932; Apr. 1934); ibidem (YUDZURU OGURA & TUGIWO HANDA, Jan. 1934); ibidem (MASAYOSI OKABE, Oct. 1934).

Marattia (*Eu-Marattia*) **Tuyamæ** NAKAI, sp. nov. (Fig. 3).

Caudex globosus magnus. Frondes usque 2 m. altæ sub-10-jugo-pinnatæ. Stipites usque 95 cm. longi 5 cm. lati virides glabri. Pinnæ usque 60 cm. longæ 20 cm. latæ pinnatæ subglabræ. Pinnulæ omnes breve sed distincte stipitatæ 7–11 cm. longæ 14–23 mm. latæ antrorsum spectantes sed sæpe subfalcato-recurvatæ, margine serrulatæ, apice acuminatæ vel subito-mucronato-acumi-



第 3 圖 東京帝國大學理學部植物學教室所藏ノひろはりうびんたいもどきノ基準標本
The type specimen of *Marattia Tugamæ* in the herbarium of Tokyo Imperial University.

natae, supra viridissimae lucidae, infra viridulae praeter costas parcissime fusco-squamatas glabrae, venis lateralibus subhorizontali-patentibus simplicibus interdum ex basi bifurcatis parallelis apice non clavatis et in serrulas terminantibus. Synangia intramarginalia 1-3.5 mm. longa fuscescencia bivalvata. Indusium fibrillosum male evolutum.

Habitat in Bonin.

Insula Kita-Iwô-tô (St. Alessandro Isl.): in planitie silvestre semper-nebulosa Sanmantubo, 800 meter. (T. TUYAMA Nov. 1935, typus).

Insula Hahazima (Coffin Isl.): in silvis montis Sekimon-yama (ATUSI YAMAMOTO, Jul. 1928).

Marattiales are a member of eusporangiate ferns most closely allied to *Helminthostachydiaceae* and *Pecopteridales*. *Helminthostachydiaceae* (NAKAI in Praelect. ad alumnos in Univ. Imp. Tokyo. anno 1932) is represented by a single living species *Helminthostachys zeylanica* HOOKER (*Osmunda zeylanica* L.). This family stands between *Ophioglossaceae* and *Marattiaceae*, but is nearer to *Ophioglossaceae* in the form of gametophyte and sporophyte. However, it is still separable from *Ophioglossaceae* by having suspensor in the embryo, the laterally parallel venation of the leaves, and the vertically dehiscent sporangia crowned by leaf-crest. Among the living *Marattiales*, *Dancea* and *Macroglossum* have also suspensor in the embryo, and their sori or synangia are surrounded by the mesophyllal walls completely or halfway. These two, therefore, are natural to distinguish from the real *Marattiaceae* (including *Marattia*, *Eupodium*, *Angiopteris*, *Archangiopteris*, *Christensenia*, *Protomarattia*) as *Danceaceae*. **Pecopteridales** m. comprises number of fossil genera such as *Asterotheca*, *Diplasterotheca*, *Hawlea*, *Acitheca*, *Ptychocarpus*, *Danaeites*, *Tetrameridium*. *Marattiopsis*, *Danaeopsis*, and some other incompletely known genera. The former six genera make a natural group **Asterothecaceae** m. (*Pecopterides* POTONIÉ, *Marattiaceae-Pecopteroidae* HIRMER) and are separable from latter two which make **Danaeopsidaceae** m. (*Marattiaceae-Danaoidae* HIRMER) by having three or four times pinnately cleft fronds, and not clavate, pinnate or forked veinlets. *Danaeopsidaceae* are nearest to *Marattiales*, yet we can hardly convince that they are the direct ancestors of the recent *Marattiales*. It would be still long before we can find the sufficient connec-

tions between these two groups awaiting farther discoveries of good fossils.

Conspectus familiarum et generum *Marattialium*.

- A. Embryo cum suspensore. Sori in fossa imperfecte immersi, vel synangia cum jugis mesophyllorum elevatis perfecte circumdantur. Archegonia (an semper ?) sine cellulis basalibus.

Danæaceæ ARARDH, Aphor. Bot. 117 (1822), pro minoribus partibus; LINDLEY, Nat. Syst. 402 (1836), pro parte.

Syn. *Marattiaceæ* IV. *Danææ* BITTER in ENGLER & PRANTL, Nat. Pflanzenfam. II 4, 442 (1900).

Caudex globosa. Folia paripinnata. Sori in fossa imperfecte immersi, indusiati. Annulus incompletus.

Macroglossum COPELAND in Philippin Journ. Sci. III 342 (1909).

Species 2 in Borneo endemicæ.

Caudex breve repens. Folia simplicia vel imparipinnata. Synangia cum jugis mesophyllorum elevatis perfecte circumdantur. Annulus perfectus.

Danæa J. E. SMITH in Mém. Acad. Turin V 420 (1793); in ROEMER, Archiv f. Bot. I pt. 2, 57 fig. 11 (1797).

Species ultra 30 in Mexico, India occid., America centr. et austr. usque ad Paraguay indigenæ.

- B. Embryo sine suspensore. Archegonia cum cellula basale ex cellula centrali divisa. Sori vel synangia supra venarum foliorum elevata, superficialia vel compitalia, indusiata vel exindusiata.

Marattiaceæ KAULFUSS, Enum. Filic. 31 (1824), excl. *Danæa*; BORY in Dict. Class. VI 586 (1824); MARTIUS, Icon. Pl. Crypt. Brasil. 119 (1834), pro omnino; LINK, Filic. Sp. Hort. Bot. Berol. 31 (1843); etc.

Sporangia nunquam synangium formant, distincta, supra venas foliorum biserialia, longitudine dehiscentia, indusiata vel exindusiata.

1. Trib. I. **Angiopteridæ** BITTER in ENGLER & PRANTL, Nat. Pflanzenfam. II 4, 436 (1900).....2

Sporangia synangium formant3

(Sori abbreviati rotundi vel elliptici cum sporangiis 2-20. Folia bipinnata. Caudex globosa erecta.

- 2 } **Angiopteris** HOFFMANN, Comment. Soc. Reg. Götting. XII, 29 (1793)
Species supra 100 in regionibus tropicis et subtropicis incola.
Sori elongati cum sporangiis 50–160. Folia paripinnata. Caudex repens.
- 3 } **Archangiopteris** CHRIST & GIESENHAGEN in Flora LXXXVI, 77 fig. 1–5 (1899).
Species 5 in Formosa, Philippin, China austr., Annam incola.
Synangia rotundata cum sporangiis radiatis in apice venularum reticulatarum compitalia et in pagina inferiore foliorum dispersa. Caudex repens. Folia palmatim 1–5 foliolata.
- 3 } Trib. II. **Kaulfussieæ** BITTER in ENGLER & PRANTL, Nat. Pflanzenfam. II 4, 442 (1900).
Christensenia MAXON in Proceed. Biolog. Soc. Washington XVIII, 239 (1905).
Syn. *Kaulfussia* (nec DENNSTÆDT non NEES) BLUME, Enum. Pl. Jav. 260 (1828).
Species unica in Philippin. Borneo, Java, Sumatra, Malaya, Assam incola.
- 4 } Synangia ellipsoidea vel elongata cum sporangiis biserialibus superficialia.
Trib. III. **Marattieæ** BITTER in ENGLER & PRANTL, Nat. Pflanzenfam. II 4, 441 (1900).....4
Caudex breve repens. Folia 1–2 pinnata. Synangia non valvata sed ab initio plana et quodque sporangium æque *Angiopteris* dehiscens.
- 4 } **Protomarattia** HAYATA in Bot. Gazette LXVII, 88, Pl. I cum synangiis male delineatis (1919).
Species 1 in Tonking incola.
- 5 } Caudex globosa erecta. Folia 2–4 pinnata. Synangia longitudine bivalvatim dehiscencia, indusiata vel exindusiata.5
Synangia supra receptaculum secus venas evoluta, indusiata vel exindusiata.
- 5 } **Marattia** SWARTZ, Prodr. Fl. Ind. Occid. 128 (1788); J. E. SMITH in RECHER, Archiv f. Bot. I pt. 2, 57 (1797).
Species 57, in regionibus tropicis vel subtropicis incola.

Synangia supra venas distincte stipitata, exindusiata.

Eupodium J. SMITH in HOOKER, Journ. Bot. IV, no. 25, 190 in obs. sub *Sphaeropteris*⁽¹⁾ (Sept. 1841) absque diagn.; HOOKER, Gen. Filic. t. CXVIII (1842).

Species 1, in America trop. incola.

小笠原列島中ノ母島^{ハハジマ}ニりうびんたいもどきト牧野博士ガ命名シタ羊齒ガアル。此羊齒ハ仙臺ノ玉木誠一君ガ大正9年ニ採集シテ牧野氏ノ鑑定ヲ乞ヒ牧野氏ハ之ヲ *Marattia ternatea* DE VRIES ト同定シテ同年ノ植物學雜誌12月號ニ發表シタ。然シ昭和3年迄ハ日本植物學者ノ誰モガ其自生品ヲ見テハ居ズ又小笠原島廳ヤ營林署勤務ノ人モ誰モ其生品ヲ見タモノハナカツタ。其故私等植物學者ハ勿論小笠原島ノ主ト迄云ハレテ居タ營林署長デアツタ豊島惣清氏モ其自生ヲ疑フ様ニナリ遂ニハ玉木君ガ小笠原島產ノ植物ト他國ノ植物トヲ混同シタノデハナイカト迄疑フ様ニナツタ。其故昭和元年ニ私ガ日本產りうびんたい科植物ノ評論ヲ植物學雜誌ニ書イタ時ニモ疑點ヲ打チ之ヲ日本ノ「フロラ」カラ除外スベキ種トシテ置イタ。昭和3年ノ春ニ小笠原島ノ營林署デ母島ノ最高峰デア^{チアサヤマ}ル乳房山ノ原始林ヲ通シテ新ニ林道ヲ開イタ。此新道ニ沿フテハ珍灌木ゆづりばわだんモ澤山アルシ島特產ノ屬デ高サ3-5米突ニナル菊科植物デア^{チアサヤマ}ルわだんのきモ夥シクアリ。殊ニ羊齒類ハ非常ニ繁茂シテ居ルガ其中ニ待望ノりうびんたいもどきガ幾本モアル(第1圖参照)。其中ノ壯大ナモノニナルト塊莖ノ直徑ハ80cm—1mニ達シ葉ノ長サハ4米突ニモナル其大サニ至テハ同ジク此林道ニ沿フテ繁茂スル長サ5-6米突ニモ達スルゆのみねしだノ葉ト共ニ最モ驚異ニ値スル、筆者ハ近年羊齒類ノ研究ヲ止メ一切ヲ伊藤洋學士ニ委ネ又小笠原島產ノ植物ハ津山尙學士ニ研究サセテ居タガりうびんたいもどきが「マラツカ」、「フィリッピン」方面ニノミアル *Marattia ternatea* ト同種デア^{チアサヤマ}ルト云フコトハ他ノ植物ノ分布カラ考ヘテモ疑ハシイノデ新ニ比較研究ヲシテ見タラりうびんたいもどきハ全ク小笠原島ニ限り生ズル所ノ新種デア^{チアサヤマ}ルコトガ判ツタ。形態ハ寧^ニモ *Marattia ternatea* ヨリモ *Marattia sambucina* ニ近ク *Marattia ternatea* ノ特異性デア^{チアサヤマ}ル所ノ羽片ガ下方ニ反り返ル様ナコトハシナイシ鱗片ガ若イ時ニ

(1) In the observation under the genus *Sphaeropteris*, J. SMITH made the following note for *Eupodium*, and this is the first publication of the name of *Eupodium*.

'A similar pedicel to that which characterizes this genus exists in a species of *Marattia*, which species I am disposed to view as constituting a genus under the name of *Eupodium*, and which is distinct from *Marattia* upon the same character that *Sphaeropteris* is distinct from the following genus.'

ハ夥シク生ジ且ツ小羽片ノ大キサモ小サク幅狭ク(第2圖参照)全クノ別種デアル、東京帝國大學理學部植物學教室ノ腊葉庫ニハ臺灣ノ標本ト交換シタ「フィリッピン」ノ標本ガ古クカラアツタガ早田氏存命中ハ他人ニ見セナカツタ爲メ吾人ノ目ニハ觸レナカツタモノ、一デアル其中ニ *Marattia sambucina* ト同定シテ「フィリッピン」ノ農務局カラ送り越シテ居ル標本中ノ一ハ正シク *Marattia ternatea* デアル。りうびんたいもどき屬ノ植物ハ約60種ガ記述サレテ居ルガ何レモ小笠原島ノモノニ該當スベキモノデナイカラ小笠原島ノモノヘハ特ニ **Marattia boninensis** NAKAI ナル新學名ヲ與ヘル。本植物ハ未ダ乳房山以外ニ産スルコトハ知レテ居ナイ。

母島ニハ尙一ツ別ノ *Marattia* ガアル。其ハ熱帶地方ニ廣ク分布スル *Marattia fraxinea* ニ近似ノ種デアリりうびんたいもどきニ比スルト鱗片ガ少ナク小羽片ハ短ク且ツ幅廣イ。此モノハ昭和3年ニ山本篤學士ガ母島ノ石門山デ採集シタノガ始メデアルガ同君ハ之ヲ私藏シテ居タ爲メ今迄判ラナカツタガ近時津山君ニ研究ヲ委セタ爲メニ世ニ出タノデアル。津山君ハ又昭和10年ニ之ト同種ヲ北硫黃島ノ山上ノ臺地デ俗ニ三萬坪ト呼ブ所ニ澤山ニ自生シテ居ルヲ發見シテ採集シタガ同君ハ山本君ノ採集品ト共ニ乳房山ノりうびんたいもどきト同定シテ居タ。本種モ亦新種デアルカラ小笠原島ノ植物ノ專攻家デアル津山君ノ名ヲ記念シテ **Marattia Tuyamæ** ノ名ヲ冠シ和名ハひろはりうびんたいもどき(第3圖参照)ト定メル。

序ニりうびんたいもどき目 *Marattiales* ノ區分ト其類縁關係トニ一言シタイ。*Marattiales* ガはなやすり目 *Ophioglossales* ニ近イ群デアルコトハ明カデハアルガ其ハみやこじまはなわらび *Helminthostachys zeylanica* ト云フ一屬一種ノ植物ガはなやすり目中ニアルカラデアル。みやこじまはなわらび屬ハ然シはなやすり目ノ他ノ屬即チはなやすり屬 *Ophioglossum*, こぶらん屬 *Ophioderma*, 「ケイログロッサ」屬 *Cheiroglossa*, はなわらび屬 *Botrychium* トハ有性生代ノ形態ガ似テ居リ又無性生代モ葉柄ノ基ガ鞘狀ニナリ次年度ノ幼芽ガ其中ニ包マレテ居ル點ヤ葉ノ側方カラ實葉ヲ出スコトモ似テ居ルガ小羽片ノ葉脈ハ中肋カラ左右ニ平行シテ葉緣ニ達シテ居ルコトハリうびんたい類ニ一致シテ居リ子囊群ノ先ニハ小サイ冠狀ノ葉ヲ附ケル、又胚ハ胚柄細胞2個ヲ有ス(はなやすり目ノ他ノ屬デハ胚柄細胞ガナイ)ルカラ獨立ノ一科みやこじまはなわらび科 **Helminthostachydiaceæ** NAKAI ヲ建テ、はなやすり科 *Ophioglossaceæ* カラ分離サセルノガ正當デアル。此みやこじまはなわらびノ葉ガりうびんたい類ニ

似テ居ルト云フ外ニハ格別はなやすり目トリうびんたいもどき目トノ間ニハ類縁關係ガアルノデハナイカラ兩目ハ相當距離ノアルモノト謂ハネバナラス。

又化石植物學者ハ化石ニ出ル莖 *Psaronius*, *Megaphyton* ヤ實葉ノ知レテ居ル古生代ノ石炭期カラ二疊期ノ下部 Rotliegend 時代迄ニ繁茂シタ *Acitheca*, *Asterotheca*, *Danaëites*, *Diplasterotheca*, *Ptycocarpus*, *Tetrameridium* 等ヤ裸葉ノミ知レテ居ル *Eupecopteris*, *Parapecopteris* ヤ中世代ノ植物デ實葉ノ知レテ居ル *Danaëopsis*, *Marattiopsis* ナドヲ *Marattiaceae* ニ入レテ居ルガ此等ハ唯聚成子囊群 Synangium ヲ有スルコトト莖ニ樹脂導管ガアルト云フコト以外ニハ現生ノりうびんたいもどき目植物トハ類縁關係ヲ定メ難イカラ私ハ其等ハ *Pecopteridales*, *Danaëopsidales* ノ二新目トシテ *Marattiales* カラ分離サセルベキコトヲ主張スル。其中 *Pecopteridales* ハ古生代ノ植物デ *Asplenium* 狀ノ葉ヲ有スルモノデアリ *Danaëopsidales* ハ中世代ノ植物デ葉ハ大キク1-2回羽狀ニ分叉シ葉脈ノ先端ハ棍棒狀ニ肥大スル類デアル。此等ヨリモ尙ホ類縁關係ノ遠イ *Anachopteridaceae*, *Botryopteridaceae*, *Etapteridaceae* 等ハ更ニ *Etapteridales* ナル新目トシテ分離スベキデアル。

Marattiales ニ入レテアル現生植物ハ *Angiopteris*, *Archangiopteris*, *Christensenia*, *Danaëa*, *Eupodium*, *Macroglossum*, *Marattia*, *Protomarattia* ノ8屬約200種ノ植物デアル。其中 *Danaëa* ト *Macroglossum* トハ胚ニ1-2個ノ胚柄細胞(Embryoträger, Suspensor) ガアリ造卵體ハ中心細胞(Centralzelle, Central cell) ガ分裂シテ直接ニ卵細胞(Eizelle, Egg cell) ト下頸道細胞(Bauchkanalzelle, Ventral canal cell) トニナリ、子囊群ハ葉肉ノ隆起中ニ沈在スルカラ他ノ5屬ノ様ニ胚ニ胚柄細胞ガナク中心細胞ハ分裂シテ先ヅ第二次中心細胞(Sekundäre Centralzelle, Secondary central cell) ト底細胞(Basalzelle, Basal cell, Venter cell) トニナリ其第二次中心細胞ガ更ニ上下ニ分裂シテ卵細胞ト下頸道細胞トニナリ、子囊群ガ葉ノ裏面ニツキ葉肉中ニ沈在セズ突出スルノトハ大ニ異ルカラ兩群ハ各獨立ノ科トシ前者ハ「ダネーア」科 *Danaëaceae* AGARDH 後者ハリうびんたいもどき科 *Marattiaceae* KAULFUSS トスベキデアル。而シテ之ヲ更ニ小區分スルト「ダネーア」科ハ(1)丸ク直立スル塊莖ト偶數羽狀複葉ト離生子囊群 Sori ト不完全ナル環帶トヲ有スル「マクログロッスム」屬 *Macroglossum* COPELAND ト(2)短キ匍匐莖ト奇數羽狀複葉ト聚成子囊群ト完全ナル環帶トヲ有スル「ダネーア」屬 *Danaëa* J.E.SMITH トニナル。又りうびんたいもどき科ハ(1)掌狀複葉ト網狀脈ト葉脈ノ合點ニ附着スル輪狀ニ丸ク一列ニ並ブ聚成子囊群トヲ有スル「カウルフツシア」族 *Kaulfussieae* BITTER ト(2)羽狀複

葉ト平行脈ト葉脈上ニ2列ニ並ブ離生子囊群トヲ有スルりうびんたい族 *Angiopteris* BITTER ト (3) 羽狀複葉ト平行脈ト葉脈上ニ2列ノ子囊ノ癒合シテ成ル聚成子囊群トヲ生ズルりうびんたいもどき族 *Marattia* BITTER トニ區別スルコトガ出來ル。其中 (1) ニハ「フィリッピン」馬來群島ヨリ東印度ニ亘ル地方ニ産スル「クリステンセンニア」屬 *Christensenia* MAXON ノミガ屬シ (2) ニハ丸キ直立スル塊莖ト奇數羽狀複葉ト短キ球形又ハ橢圓形ノ子囊群トヲ有スルりうびんたい屬 *Angiopteris* HOFFMANN ト、匍匐莖ト偶數羽狀複葉ト細長キ子囊群トヲ有スルむかしりうびんたい屬 *Archangiopteris* CHRIST & GIESENHAGEN トガ屬シ (3) ニハ丸キ直立スル塊莖ト2-4 回分岐スル羽狀複葉ト葉脈上ニ縦ニ附着スル聚成子囊群ハ成熟スレバ縦ニ裂開シテ2瓣トナリ始メテ2列ノ子囊群ヲ展開スル所ノりうびんたいもどき屬 *Marattia* SWARTZ ト之ト類似型ニテ子囊群ニ長キ柄ヲ有スル「ユウボデウム」屬 *Eupodium* J. SMITH ト短キ匍匐莖ト1-2 回分岐スル奇數羽狀複葉ト聚成子囊群ガ始メカラ開イテ2列ニ平面ニ並ブ所ノ「プロトマラッチア」屬 *Protomarattia* HAYATA トガ隸屬スル。因ニ記スガ *Protomarattia* ハ故早田氏ガ東京ノ山中デ發見シ生品ヲ持歸ツタモノデアリ小石川植物園ノ温室ニハ全世界唯一ノ本種ノ栽培品ガアル、此植物ハ匍枝カラ不定芽ヲ出シテ繁殖シ孢子ハ發芽力ガナイ。然シ割合ニ栽培ノ容易ナモノデアリ小石川植物園ノ諸トスルモノデアルガむかしりうびんたい屬ノ方ハ當時早田氏ガ持歸ツタ東京産^{トンキン}ノモノハ勿論其後兩三度移植シタ臺灣産ノむかしりうびんたいモ移植後次第ニ衰へ三年モスルト枯死消滅スル。其枯死ノ原因ガ何デアルカハ未ダニ判ラヌガ兎モ角栽培ノ困難ナモノデアル。みやこじまはなわらびハ本年伊藤洋氏^{イリオモテジマ}ガ西表島デ採集シテ來タ生品ガ始メテ小石川植物園ニ來タ、之ハ東京ヘ來タ最初ノみやこじまはなわらびノ生品デアリ大切ニ栽培ハシテ居ルガ栽培可能デアルカ否カハ今後ノ經驗ニ俟ツヨリ外ハナイ。厚子囊羊齒類 *Filices Eusporangiate* ニモ斯ク栽培ノ容易ナモノト困難ノモノトガアルガ薄子囊羊齒類 *Filices Leptosporangiate* ニモ困難ナモノガ澤山ニアル蟻植物ナル *Myrmecophila* 屬ヤ陸生植物ナルすじひとつば、やぶれがさうらばしナドハ未ダ栽培ニ成功シタコトハ一回モナイ。同ジ蟻植物デモ *Lecanopteris* ハヨク生育スルガ之ニ寄生スベキ蟻ガ日本ニ居ナイ爲メ匍匐莖ハ恰モあをねかづらノ様ニ細長クナリ熱帶地方デ蟻ノ巢トナツテ居ル時ノ様ニ塊狀ニ膨マナイ。着生羊齒類ハ一般ニ栽培シ易クかざりしだノ如キニ至ツテハ土ニ植エテモヨク育ツ。はこねしだハ始メ栽培ガ困難トサレテ居タガ筆者ガ日本ノ園藝家ガ外國ノ *Adiantum* ノミヲ栽培スルノニ憤慨シテ植物園デ工夫ヲサセタ所今デハ他ノ *Adiantum* ノ何レ

ヲモ凌グ程美事ナ盆栽ニ仕立テ得ル様ニナツタ。小笠原島ノ珍羊齒トシテ知ラル、ひめたにわたりナドハ溫室内デ原生地ノ數倍ノ大サニ育チ實生モヨク出來ル、かしのはしだ *Quercifilix repanda* ナドハ筆者が大正9年ノ春ニ香港ノ石垣ニ生エテ居タモノヲポケットニ入レテ歸ツタガ生キテ盛ニ育ツテ居ル。大凡現生植物中羊齒類位變化ニ富ンダモノハ少ク之ヲ栽培スルコトハ又無限ノ快ヲ人生ニ與ヘル特ニ日本ハ世界デモ有數ナ羊齒類ノ產地デアルカラ同好ノ士ニ羊齒類ノ栽培ヲ御薦メスル。

Morphologisch-biologische Studien über die Gattung *Mitrastemon* (V)

von

KIYOHICO WATANABE

渡邊清彦： やっこさう屬ノ形態學的並ニ生態學的研究 (其五)

XIII. Experimenteller Versuch über die Samenbildung.

In den Inseln Kiushū und Shikoku ist die Fertilität von *M. Yamamotoi* sehr niedrig. Um die Ursache dieser Tatsache zu erklären, machte ich an Kōyama wiederholt Bestäubungsversuche wie Tabelle III. Diese waren folgenderweise durchgeführt: an einer Gruppe nahm ich die Pollen aus den fertig gewordenen Andröceumröhren und strich sie an den neulich abgeputeten Narben, zu sehr ältere oder zu sehr jüngere Blüten waren davon abgeschnitten. Die Resultate wurden im nächsten Frühling untersucht.

Bestäubung	Prüfung	Gruppe	Örtlichkeit	Behandlung	fertile Früchte	sterile Fruchtknoten	Fertilität %
29. Nov. 1932	6. Apr. 1933	Nr. 1.	Shiroyama	künst. best.	0	35	0
		Nr. 2.	Shiroyama	künst. best.	2	20	9
		Nr. 3.	Shiroyama	künst. best.	3	25	11
		Nr. 4.	Shiroyama	künst. best.	2	33	6
		Nr. 5.	Shiroyama	nicht k. best.	1	19	5
18. Nov. 1933	6. Apr. 1934	Nr. 6.	Nosaki	künst. best.	1	4	25
8. u. 9. Nov. 1934	11. März 1935	Nr. 7.	Shiroyama	künst. best.	31	16	66
		Nr. 8.	Shiroyama	künst. be.t.	29	11	72
		Nr. 9.	Nosaki	künst. best.	42	33	56
		Nr. 10.	Nosaki	nicht k. be.t.	1	54	2

Tabelle III. Fertilität von *M. Yamamotoi* an Kōyama, Provinz Ōsumi.